

REMARKS

Claims 1, 3-8, and 10-20 are pending in the application. Applicant has added new claims 21-26. Claims 5-8, 11-14, and 18-20 are allowed. Claims 1, 3, 4, 10, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mizuuchi et al. (U.S. Patent No. 5,652,674) ("Mizuuchi"). Applicant has added new claims 21-26 to more particularly claim the invention and to submit the following arguments to traverse the prior art rejections.

As a preliminary matter, Applicant believes that the finality of the Office Action is improper because the Examiner has relied on a new ground of rejection in his rejection of the claims. Specifically, the Examiner rejected the claims (including claims 1, 2) based on 35 U.S.C. § 102(b) under Mizuuchi in the previous Non-Final Office Action. In the Final Office Action, however, the Examiner essentially withdraws the anticipation rejection but rejects the same claims under 35 U.S.C. § 103(a) as being unpatentable over Mizuuchi. Because the Examiner has introduced a new ground of rejection for subject matter previously before the Examiner (subject matter of claims 1, 2), Applicant requests the Examiner to withdraw the finality of the Final Office Action.

Applicant's invention relates to a wavelength converting element and a method of manufacture thereof. Applicant refers the Examiner to the explanation of the invention and the reference in the Amendment of November 26, 2003.

Applicant submits that claim 1 is patentable because Mizuuchi fails to teach, suggest, or provide motivation for wherein the waveguide is formed by proton implantation, in combination with other elements. First, Applicant submits that proton exchange as taught by Mizuuchi, is

entirely different from proton implantation as taught in the invention. Proton exchange takes place by thermally treating a substrate in an acid at high temperatures. *See* col. 19, lines 61-65, and col. 20, lines 14-16. The metal ions in the substrate are “exchanged” with the proton ions in the acid. *See id.* Specifically, the Li^+ ion is exchanged with a H^+ ion. To the contrary, proton implantation involves bombarding a substrate with a beam of protons, i.e., the H^+ ion is implanted into the target crystal while the Li^+ ion remains in the crystal. As an another point of distinction, the implantation of the protons depend, in part, to the implantation energy of the protons, rather than a thermal treatment of a substrate in an acid at high temperatures, as is the case in proton exchange. *See* Specification, lines 7-8, page 14. Therefore, proton exchange of Mizuuchi does not teach, suggest, or provide motivation for proton implantation as claimed.

Further, Applicant submits that the supposed equivalence between “exchanged” and “implanted” does not support the purported obviousness of proton implantation when proton exchange is taught. One skilled in the art would easily recognize that the two process are different in view of the technical differences between proton exchange and proton implantation.

As noted by the Examiner, Mizuuchi states that “[a]s the optical waveguide, other optical waveguides such as a Ti diffusion waveguide, an Nb diffusion waveguide or an ion implantation waveguide can be used instead of the waveguide formed by proton exchange described above.” Col. 21, lines 1-4. Applicant, however, submits that proton implantation for waveguide formation is still not suggested or motivated by the reference. Applicant would request the Examiner to provide prior art which shows that it would have been obvious to modify Mizuuchi to incorporate proton implantation as recited in the claims.

Furthermore, Applicant submits that the Examiner has not established a *prima facie* case of obviousness because he has not provided any objective reason to modify the teachings of Mizuuchi to incorporate proton implantation as recited in the claim. M.P.E.P. 2143.01.

Claim 15, which depends from claim 1, is patentable for at least the reasons submitted for claim 1. In addition, or alternatively, claim 15 is patentable because Mizuuchi fails to teach, suggest, or provide motivation for the waveguide formed in the interior of the optical crystal substrate and *substantially not exposed to an exterior* of the optical substrate, in combination with other elements of the claim. Rather, the examples cited by the Examiner teach waveguides substantially exposed to the exterior of the optical substrate (col. 21, lines 1-4 (“EXAMPLE 2”); col. 39, lines 9-13 (“EXAMPLE 12”)), or make no mention regarding waveguides at all (col. 24, lines 20-26 (“EXAMPLE 3”)).

For reasons similar to those submitted above for claim 1, claim 3 is patentable.

Applicant submits that claim 4 is patentable because Mizuuchi fails to teach, suggest, or provide motivation for forming inverted domains *after* a waveguide has been formed at an interior of an optical crystal substrate by carrying out ion implantation. Although Mizuuchi discusses the possibility of forming an optical waveguide first, and then a domain-inverted region (col. 39, lines 19-27), as the Examiner states, the optical waveguide is disclosed as being formed by diffusion (col. 39, lines 14-16), *not* ion implantation, as claimed. Thus, claim 4 is patentable for at least the above reasons.

Claim 10, which depends from claim 4, is patentable for at least the reasons submitted for claim 4.

AMENDMENT UNDER 37 C.F.R. § 1.116
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With regard to the Examiner's Statement on Reasons for Allowance, Applicant would submit that independent claim 5 does not include the specific geometric expression cited by the Examiner.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


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